# US Army Medical Research and Materiel

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## High Efficiency Balanced Oscillating Shuttle Pump

This invention provides an improved high-efficiency oscillating shuttle pump which overcomes the drawbacks of prior pumps. The pump includes a shuttle block which partially compresses the tubes in a balanced, alternating manner. As one of the two parallel tubes is compressed, fluid is pumped out of the first tube and at the same time fluid is drawn into the second tube as the first tube resumes its original shape. The resilience of both tubes is also used to assist the pumping actions in a balanced fashion, thereby providing a pump that has both low power consumption and is lightweight.

Pumping devices are frequently used in the medical arena. Some, for instance, are used as implantable circulatory assist devices for aiding or substituting heart action. Pumps currently utilized in pumping liquid or fluids through tubes, however, momentarily occlude the tubes and affect pumping capabilities because they utilize a piston-type plunger. Therefore, the total occlusive nature of the pumping action is a significant drawback of prior pumps since efficiency is greatly reduced. Additionally, such occlusion causes high shear stress and cellular damage [illegible] ese devices are used to pump sensitive fluids, such as blood.

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The improved shuttle pump has many potential applications in the medical environment and in other environments. These pumps may be utilized for the delivery of resuscitation fluids in emergency situations or combat casualties.

### Features and advantages:

- Utilizes a non-occlusive design
- Minimizes cell damage and hemolysis when blood or other fluids are being pumped
- May be battery or solar powered, rendering the pump operational for days to weeks
- Can increase the pumping capacity through more power or by using more than one pump
- May allow for delivery of tissue culture fluids [illegible] space shuttle vehicles

### Patent Status

### Point of Contact

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